CENTRAL VALLEY REGIONAL WATER QUALITY CONTROL BOARD

APPENDIX E
CATEGORY 4B DEMONSTRATION

DRAFT STAFF REPORT

ADDRESSING DIURON IMPAIRMENTS IN THE SACRAMENTO AND SAN JOAQUIN RIVER BASINS

MARCH 2018

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

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1 Category 4b Demonstration

USEPA regulations recognize that alternative pollution control requirements may obviate the need for a TMDL in some cases. Specifically, segments are not required to be included on the Section 303(d) list if "[o]ther pollution control requirements (e.g., best management practices) required by local, State, or Federal authority" are stringent enough to implement applicable water quality standards (WQS) (see 40 CFR 130.7(b)(1)) within a reasonable period of time. Demonstrating that other pollution control requirements obviate the need for a TMDL is commonly referred to as a "Category" 4b demonstration, in reference to one of the waterbody classifications used in Clean Water Act section 303(d)/305(b) Integrated Reports.

An October 2006 USEPA memorandum (USEPA, 2006) provided the recommended structure for addressing USEPA's expectations for Category 4b demonstrations. Category 4b demonstrations are expected to address the following six elements:

1. Identification of segment and statement of problem causing the impairment;
2. Description of pollution controls and how they will achieve water quality standards;
3. An estimate or projection of the time when WQS will be met;
4. Schedule for implementing pollution controls;
5. Monitoring plan to track effectiveness of pollution controls; and
6. Commitment to revise pollution controls, as necessary.

The analysis provided below presents relevant sections of the October 2006 USEPA memorandum shown in indented text followed by the demonstration, for fourteen diuron impairments, of how these expectations are addressed through the State's pollution control requirements established through Waste Discharge Requirements (WDRs) under the Central Valley Water Board's Irrigated Lands Regulatory Program (ILRP). The diuron impairments for these fourteen waterbody segments have been proposed for inclusion in category 4b in the State's 2014/2016 Clean Water Act Section 303(d)/305b Integrated Report (SWRCB, 2017). This appendix provides further documentation to support the category 4b demonstrations for diuron in these water body segments. .

1.1 Identification of Segment and Statement of Problem Causing Impairment

"***Identification of Segment and Statement of Problem Causing Impairment Segment Description***

The demonstration should identify the impaired segment, including name, general location in the State, and State-specific location identifier. Also, the segment should be identified/georeferenced using the National Hydrography Dataset (NHD). The assessment information should be transmitted electronically through the Assessment Database (ADB)."

The impaired segments being considered for a "4b" classification are those listed in Table E-1-1. These segments were identified to USEPA on the 2014 integrated report submittal to USEPA which included geo-referencing of the impaired segments and compatibility with USEPA's ADB.

> *"**Impairment and pollutant causing impairment***
>
> *The demonstration should identify the applicable water quality standard(s) not supported for each segment and associated pollutant causing the impairment."*

The water quality standards not being attained are the narrative toxicity objective and narrative pesticide water quality objectives which are established in the Water Quality Control Plan for the Sacramento and San Joaquin River basins. The narrative pesticide water quality objective states (page III-6.00 of the Basin Plan):

> "No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
>
> Discharges shall not result in pesticide concentrations in bottom sediments or aquatic life that adversely affect beneficial uses.
>
> Pesticide concentrations shall not exceed those allowable by applicable antidegradation policies.
>
> Pesticide concentrations shall not exceed the lowest levels technically and economically achievable."

The narrative water quality objective for toxicity that applies to toxicity caused by pesticides; it specifies (pages III-8.01-9.00):

> "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, and biotoxicity tests of appropriate duration or other methods as specified by the Regional Water Board.
>
> The Regional Water Board will also consider all material and relevant information submitted by the discharger and other interested parties and numerical criteria and guidelines for toxic substances developed by the State Water Board, the California Office of Environmental Health Hazard Assessment, the California Department of Health Services, the U.S. Food and Drug Administration, the National Academy of Sciences, the U.S. Environmental Protection Agency, and other appropriate organizations to evaluate compliance with this objective."

For more information about these objectives see Section 2.2.4 of the Staff Report.

The impaired segments are listed in Table E-1-1 and the associated pollutant causing impairment in these segments is diuron.

> *"**Sources of pollutant causing impairment***
>
> *The demonstration should include a description of the known and likely point, nonpoint, and background (upstream inputs) sources of the pollutant causing the impairment, including the magnitude and locations of the sources. In cases where some portion of the impairment may result from naturally occurring sources (natural background), the demonstration should include a description of the naturally occurring sources of the pollutant to the impaired segment."*

The primary source of diuron to the impaired segments being considered are agricultural. The most common crops diuron is used on in these waterbodies include alfalfa, walnuts, grapes, citrus and cotton. Other potential sources of diuron are MS4s and rights of way. The known sources of diuron to each waterbody proposed for Category 4b are listed in Table E - 1-2. These sources were either identified in source evaluations in the management plans or were determined by looking at the pesticide use reporting data of the watershed areas. All potential sources of diuron to Central Valley Waterbodies are thoroughly discussed in Section 2.1.

Table E - 1-1 List of impaired water bodies being considered for Category 4b classification with location

Impaired Water Body (Location in CA)	**Management Plan Adoption Date**	**Estimated Plan Completion Date***	**Plan Completion Date***
Cottonwood Creek (S Madera County)	2009	-	2012
Del Puerto Creek (Stanislaus County)	Original 2011 Revised plan approval expected in 2018**	2017	-
Dry Creek (Madera County)	2009		2017
Dry Creek (tributary to Tuolumne River at Modesto, E Stanislaus County)	2008	-	2012
Hospital Creek (San Joaquin and Stanislaus Counties)	~~2008~~ TBD**	2018	-
Ingram Creek (from confluence with Hospital Creek to Hwy 33 crossing)	Original 2008 Revised plan approval expected in 2018**	2018	-
Lone Tree Creek (San Joaquin County)	2008	-	2012

Main Drain (Kern County)	2008	2018	-
Orestimba Creek (above Kilburn Road)	Original 2011 Revised plan approval expected in 2018**	2021	-
Orestimba Creek (below Kilburn Road)	Original 2011 Revised plan approval expected in 2018**	2021	-
Ramona Lake (Stanislaus County)	Original 2011 Revised plan approval expected in 2018**	2019	-
San Joaquin River (Bear Creek to Mud Slough)	Original 2011 Revised plan approval expected in 2018**	2017	-
Ulatis Creek (Solano County)	2009	-	2016
Willow Slough Bypass (Yolo County)	2010	2020	-

*Estimated Plan Completion Date is either the date set by the Management Plan for their expected completion or the required attainment date, which is 10 years from the exceedances triggering management plan development. For the water bodies with completed management plans the completion date is listed in the Plan Completion Date Column. Completion is approved by the Central Valley Water Board's Executive Officer when water quality monitoring shows two consecutive years of compliance with water quality trigger limits during months of previous exceedances.

** A comprehensive management plan for water bodies in the Westside Coalition is currently under review and expected to be approved soon. This plan will replace the existing management plans for some water bodies (original adoption dates are struck through).

Table E - 1-2 Sources of Diuron to Potential Category 4b Waterbodies

Waterbody	General Sources
Ulatis Creek	Alfalfa, Grapes, Right-of-way*
Willow Slough Bypass	Alfalfa, Walnut, Right-of-way*, Landscape Maintenance*
Lone Tree Creek	Alfalfa, Grapes, Walnuts
Cottonwood Creek	Citrus, Grapes, Alfalfa, Right-of-way*
Dry Creek (Madera)	Citrus, Grapes, Right-of-way*
Dry Creek (Stanislaus)	Walnuts
Del Puerto Creek	Alfalfa, Walnut, Grape, Right-of-way*
Hospital Creek	Alfalfa, Citrus, Walnut, Grapes, Right-of-way*, Landscape Maintenance*
Ingram Creek	Alfalfa, Walnut, Right-of-way*, Landscape Maintenance*
Orestimba Creek	Alfalfa, Citrus, Walnut, Right-of-way*, Landscape Maintenance*

* Rights-of-way and landscape maintenance are lesser sources to these waterbodies, and have not been shown to significantly affect concentrations in these waterbodies. Monitoring data shows controlling agricultural sources can result in diuron concentrations which are in attainment of water quality standards.

1.2 Description of Pollution Controls and How They Will Achieve Water Quality Standards

"Description of Pollution Controls and How They Will Achieve Water Quality Standards

Water quality target

The demonstration should identify a numeric water quality target(s) – a quantitative value used to measure whether or not the applicable water quality standard is attained. Generally, the pollutant of concern and the numeric water quality target are, respectively, the chemical causing the impairment and the numeric criteria for that chemical contained in the water quality standard. The demonstration should express the relationship between any necessary reduction of the pollutant of concern and the attainment of the numeric water quality target. Occasionally, the pollutant of concern is different from the pollutant that is the subject of the numeric water quality target (e.g., when the pollutant of concern is phosphorous and the numeric water quality target is expressed as dissolved oxygen (DO) criteria). In such cases, the

Category 4b demonstration should explain the linkage between the pollutant of concern and the chosen numeric water quality target. In other cases, multiple indicators and associated numeric target values may be needed to interpret an individual water quality standard (e.g., multiple fish habitat indicators to interpret acceptable sediment levels). In cases where the impairment is based on non-attainment of a narrative (nonnumeric) water quality criterion, the Category 4b demonstration should identify one or more appropriate numeric water quality target levels that will be used to evaluate attainment of the narrative water quality criteria. The Category 4b demonstration should also describe the basis for selecting the numeric target levels."

In the WDRs adopted by the ILRP coalitions as well as the WDR for Individual Growers, there are surface water limitations that specify that wastes discharged cannot cause or contribute to an exceedance of applicable water quality objectives, unreasonably affect applicable beneficial uses or cause or contribute to a condition of pollution or nuisance. For pollutants without specific numeric water quality objectives, the Central Valley Water Board develops water quality trigger limits (WQTLs), in coordination with CDPR and stakeholders, to evaluate the condition of a water body and determine whether irrigated agriculture operations are causing or contributing to any surface water quality problems.

Diuron, the pollutant of concern, does not have a numeric water quality objective or a federal water quality criteria and thus has a WQTL. For diuron, the Central Valley Water Board's ILRP currently uses a trigger limit of 2 µg/L, which is a human health criterion, as described in the Staff Report, protective of the municipal and domestic supply (MUN) beneficial use. The concentration corresponds to the Sacramento/San Joaquin Basin Plan toxicity objective based on the one-in-a-million incremental cancer risk estimates for drinking water and the USEPA health advisory of the concentration likely to be carcinogenic to humans (U.S. Environmental Protection Agency, 2005 Guidelines for Carcinogen Risk Assessment). In the 2014 Integrated Report, the Central Valley Water Board used an aquatic life criteria of 1.3 µg/L as an evaluation guideline to assess attainment of the narrative water quality objectives. This criteria was developed by UC Davis using the UC Davis methodology (Tenbrook et al., 2010) and represents the NOEC for the most sensitive species for which acceptable toxicity data was available, the green algae *Pseudokirchneriella subapitata* (formerly, *Selenastrum capricornutum* Printz) (Fojut et al. 2012). It was derived to be protective of sensitive species, species in the ecosystem, and threatened and endangered species using peer reviewed and accessible data. These aquatic life and human health protection criteria will continue to be utilized to determine attainment of narrative water quality objectives. If, in the future, updated criteria become available, (such as those that incorporate data from Delta phytoplankton species currently being developed by UC Davis under contract with the Board, as discussed in the staff report), the Board may utilize those criteria, as appropriate.

Despite the discrepancy between the ILRP trigger value and the chronic aquatic life criteria used in creating the 2014 303(d) List, data indicates that the 2.0 ug/L trigger limit when implemented through ILRP management plans is achieving the lower 1.3 ug/L criteria. The exceedance rate from pre-2009 in the fourteen Category 4b proposed waterbodies was 18%; whereas the exceedance rate after 2009 when most of the ILRP management plans had been adopted fell to 6%. Water Board staff also anticipates proposing that nine of the fourteen Category 4b proposed waterbodies are expected to be

delisted during the 2018 Integrated Report based on recent water quality data showing attainment of all objectives, utilizing the water quality criteria described above. The data demonstrating attainment were collected after the August 2010 solicitation cutoff for the 2014 Integrated Report, so these waterbodies could not be proposed for delisting for diuron in the 2014 Integrated Report. It is expected that continued implementation of the State's ILRP WDRs will resolve the remaining five diuron impairments shown in Table E-2-1.

To achieve the ILRP WQTL, ILRP third party coalitions or individual growers are required to submit a Surface Water Quality Management Plan (SQMP) or a CSWQMP. These management plans incorporate education and outreach components, implementation of management practices, and water quality monitoring. Management practices are utilized to achieve attainment of the water quality triggers in these waterbodies.

> ***"Point and nonpoint source loadings that when implemented will achieve WQS***
>
> *The demonstration should describe the cause-and-effect relationship between the water quality standard (and numeric water quality target as discussed above) and the identified pollutant sources and, based on this linkage, identify what loadings are acceptable to achieve the water quality standard. The cause-and-effect relationship may be used to determine the loading capacity of the water body for the pollutant of concern. However, a loading capacity may not be relevant in all circumstances. For example, a loading capacity would not be relevant in situations where the pollutant source will be completely removed. The demonstration should identify the loading capacity of the segment for the applicable pollutant or describe why determination of the loading capacity is not relevant to ensure that the controls are sufficient to meet applicable water quality standards.*
>
> *The demonstration should also contain or reference documentation supporting the analysis, including the basis for any assumptions; a discussion of strengths and weaknesses in the analytical process; and results from any water quality modeling or data analysis."*

Diuron concentrations are a direct result of the diuron concentrations being discharged upstream within the same time period that concentrations are measured. Attaining the numeric water quality target is directly a function of the concentration in discharges to the impaired water bodies during the time attainment is needed, and the time immediately subsequent to allow for travel time, which is on the order of days to hours for the impaired segments under consideration. Since this is a concentration-based trigger, the loading capacity for each of the segments being considered can be defined using the criteria concentration multiplied by the flow to determine an allowable mass per time. The sum of the discharges multiplied by the flow for each segment would need to be less than the assimilative capacity for each segment. While the assimilative capacity varies for each of these segments during different flow conditions, the attainment of the assimilative capacity can be directly assessed by concentration measurements in the impaired segments.

> ***"Controls that will achieve WQS***

The demonstration should describe the controls already in place, or scheduled for implementation, that will result in reductions of pollutant loadings to a level that achieves the numeric water quality standard. The demonstration should also describe the basis upon which the State concludes that the controls will result in the necessary reductions."

The controls that will achieve water quality standards are those being implemented by agricultural dischargers under the ILRP. As discussed in more detail under "**Description of requirements under which pollution controls will be implemented**", ILRP third party coalitions or individual growers are required to submit a Surface Water Quality Management Plan (SQMP) or a CSWQMP when monitoring shows that water quality has exceeded the WQTL twice over a three year period. These management plans incorporate education and outreach components, implementation of management practices, and water quality monitoring. Management practices are utilized to achieve attainment of the water quality triggers in these waterbodies. For each of the segments in Table E-1-1, a management plan addressing diuron discharges has been developed by agricultural dischargers and implemented by agricultural dischargers under the ILRP WDRs. These management plans must be implemented until they are approved as complete by the Central Valley Water Board's executive officer. Management plans are deemed complete when concentrations no longer exceed the trigger limits in the water body segments addressed by that management plan.

There are many agricultural management practices that are effective in reducing offsite movement of diuron into surface water. Many of these mitigation practices are currently being utilized to improve water quality in impaired water bodies, which is detailed below in the individual water body evaluations (Section 4.1.3). The majority types of management practices available for reducing diuron agricultural dischargers are:

Herbicide Application Practices
Vegetation Management
Water Management

Herbicide application practices include turning off outward-facing sprayer nozzles on the ends and outsides of rows, improving sprayer technologies, conducting frequent calibration of sprayer equipment, using aerial drift retardants, improving mixing and loading procedures, timing of application, and other practices that reduce application rates or mitigate offsite pesticide movement. Herbicide application practices also include following label requirements, which include drift management practices.

Vegetation management practices increase infiltration and/or decrease runoff and drift. Examples of these types of practices include planting cover crops, buffer strips, or allowing native vegetation to grow where they would reduce runoff rates and drift.

Water management practices include improvements in water infiltration and runoff control include increased irrigation efficiency and distribution uniformity, increased use of soil moisture monitoring tools, increased use of tailwater return systems, and vegetated drainage ditches.

All of these practices can result in significant reductions of the discharges of diuron. Ultimately if necessary the practices include ones that completely eliminate irrigation return flows and the use of alternatives to diuron in the rainy season. Therefore these practices can result in the necessary reductions to achieve the numeric water quality standards. The practices utilized may vary from field to field but the regulatory requirements will ensure that the practices implemented will continue to be improved until the impairments are addressed.

Data has indicated that implementation of ILRP management plans are effective in achieving both the ILRP trigger limit and the UC Davis aquatic life criterion. In addition, there are nine waterbodies proposed for Category 4b designation in the 2014 Integrated Report that have enough data (collected after the 2010 data cutoff for the 2014 Integrated Report) to support delisting in the 2018 Integrated Report. The success of achieving water quality standards is directly the result of implementation of ILRP management plans and incorporation of the best management practices described above.

"Description of requirements under which pollution controls will be implemented

The demonstration should describe the basis for concluding that the pollution controls are requirements or why other types of controls already in place may be sufficient, as discussed below.

As discussed in the 2006 IR guidance, EPA will consider a number of factors in evaluating whether a particular set of pollution controls are in fact "requirements" as specified in EPA's regulations, including: (1) authority (local, State, Federal) under which the controls are required and will be implemented with respect to sources contributing to the water quality impairment (examples may include: self-executing State or local regulations, permits, and contracts and grant/funding agreements that require implementation of necessary controls); (2) existing commitments made by the sources to implement the controls (including an analysis of the amount of actual implementation that has already occurred); (3) availability of dedicated funding for the implementation of the controls; and (4) other relevant factors as determined by EPA depending on case specific circumstances.

Since the overriding objective of the 4b alternative is to promote implementation activities designed to achieve water quality standards in a reasonable period of time, for all of the factors listed above, EPA will evaluate each 4b alternative on a case-by-case basis, including in particular the existence of identifiable consequences for the failure to implement the proposed pollution controls. Depending on the specific situation, "other pollution control requirements" may be requirements other than those based on statutory or regulatory provisions, as long as some combination of the factors listed above are present and will lead to achievement of WQS within a reasonable period of time. For example, established plans of government agencies that require attainment of WQS within a reasonable period of time may qualify even when their components include incentive-based actions by private parties. States may also choose to rely on controls that have already been implemented where there is sufficient certainty that implementation will continue until WQS are achieved and will not be reversed. Because the controls are already in

place and achieving progress, EPA may consider such controls to be requirements even if their implementation did not occur pursuant to binding legal authority."

Pursuant to the Porter-Cologne Water Quality Control Act, the Central Valley Water Board has adopted Waste Discharge Requirements for all irrigated agricultural dischargers of diuron in the Central Valley Region as part of the ILRP. Therefore all agricultural sources of diuron to the water bodies for which the narrative water quality objectives are established are regulated under state authority. These WDRs require implementation of management practices so that all water quality standards are attained within ten years of an exceedance of the water quality objectives. The agricultural dischargers must have submitted management plans detailing specific practices that will be implemented within sixty days of the report of an exceedance or must update or create a CSWQMP. These management plans must detail specific management practices to be implemented to achieve water quality objectives as soon as possible but no later than 10 years away.

When there is an exceedance of the numeric trigger used to identify if there is a potential to cause or contribute to a water quality impairment, ILRP WDRs require the coalition or the individual grower to submit a SQMP to the Central Valley Water Board within sixty days. The sixty day period begins the first business day after the third party's receipt of the field or laboratory results that reported the exceedance. The Central Valley Water Board next posts the proposed SQMP for a public review and comment period. Stakeholder comments are considered by Central Valley Water Board staff to determine if additional revisions are appropriate. Members shall comply with the management plans once they are approved by the Executive Officer. In lieu of submitting separate SQMPs in the sixty day timeframe, the third-party may submit an annual CSWQMP or update the CSWQMP approved under the Coalition Group Conditional Waiver to conform to the WDR.

The SQMP or CSWQMP must contain an introduction that discusses the contaminant of concern (COC) and identifies the boundaries of the plan and how they were delineated. It must include a discussion of the physical conditions affecting surface water through identifying crops grown within the area on a map, identifying potential irrigated agriculture sources of the COC or designing a study to determine the sources, listing the affected beneficial uses, identifying existing management practices, providing a summary of available surface water quality data, and describing the watershed area. The plan must also provide a description of the approach it will utilize to meet water quality triggers with key components including education to promote prevention, protection and remediation, identification and implementation of best management practices, outreach to disseminate information to participating growers, a specific schedule and milestones for implementation of management practices and tasks outlined in the SQMP and measurable performance goals. The SQMP also includes monitoring requirements to measure the effectiveness at achieving SQMP goals and objectives. Locations of monitoring sites and the monitoring schedule (including frequencies) are included in the SQMP and corresponding data is submitted electronically to the Central Valley Water Board. Finally the SQMP mandates that the third-party must prepare an annual Management Plan Progress Report for the Central Valley Water Board that summarizes progress in implementing management plans.

The ILRP WDRs mandate the compliance of water quality triggers must be met as soon as possible, but not to exceed ten years from the date the SQMP is submitted for approval by the Executive Officer. All waterbodies listed in Table E-1-1 which being proposed for "4b" classification have active or completed SQMPs regulated under ILRP.

1.3 An Estimate of Projection of the Time When WQS Will Be Met

"3. Estimate or Projection of Time When WQS Will Be Met

EPA expects that segments impaired by a pollutant but not listed under Section 303(d) based on the implementation of existing control requirements will attain WQS within a reasonable period of time.

The demonstration should provide a time estimate by which the controls will result in WQS attainment, including an explanation of the basis for the conclusion. The demonstration should also describe why the time estimate for the controls to achieve WQS is reasonable. EPA will evaluate on a case-specific basis whether the estimated time for WQS attainment is reasonable. What constitutes a "reasonable time" will vary depending on factors such as the initial severity of the impairment, the cause of the impairment (e.g., point source discharges, in place sediment fluxes, atmospheric deposition, nonpoint source runoff), riparian condition, channel condition, the nature and behavior of the specific pollutant (e.g., conservative, reactive), the size and complexity of the segment (e.g., a simple first-order stream, a large thermally stratified lake, a density-stratified estuary, and tidally influenced coastal segment), the nature of the control action, cost, public interest, etc."

As discussed above, ILRP WDRs require compliance with water quality triggers as soon as possible but not to exceed ten years from the date the SQMP is submitted for approval by the Executive Officer. Table E-1-1 lists the SQMP or CSWQMP adoption date and estimated date of compliance for the impaired segments being proposed for 4b classification.

1.4 Schedule for Implementing Pollution Controls

"4. Schedule for Implementing Pollution Controls

The demonstration should describe, as appropriate, the schedule by which the pollution controls will be implemented and/or which controls are already in place."

All waterbodies being proposed for "4b" classification have active or completed SQMPs or CSWQMPs regulated by ILRP. As discussed above the ILRP WDRs dictate that SQMPs include a specific schedule and milestones for the implementation of management practices and task outline in the SQMP. Included in this schedule are the time estimated to identify new management practices as necessary to meet water quality objectives and a timetable for implementation of identified management practices.

Specific schedules for implementing the pollution controls for each segment are included in the management plans, as discussed below in Section E-2.

1.5 Monitoring Plan to Track Effectiveness of Pollution Controls

"5. Monitoring Plan to Track Effectiveness of Pollution Controls

The demonstration should include a description of, and schedule for, monitoring milestones to track effectiveness of the pollution controls. The demonstration should describe water quality monitoring that will be performed to determine the combined effectiveness of the pollution controls on ambient water quality. If additional monitoring will be conducted to evaluate the effectiveness of individual pollution controls, EPA encourages States to include a description of these efforts as well. The demonstration should identify how and when assessment results from the monitoring will be reported to the public and EPA."

The ILRP WDRs require agricultural dischargers to monitor in waterbodies where management plans are being implemented. This monitoring must be conducted during times when exceedances have been observed. All impaired waterbodies being proposed for "4b" classification have management plans which require monitoring to evaluate the effectiveness at achieving the goal and objectives of the SQMP. This monitoring must be capable of determining whether management practice changes made in response to the management plan are effective and can comply with the terms of the WDRs. The ILRP WDRs mandates that the location(s) of the monitoring site(s) and schedule (including frequencies) for monitoring should be representative of the constituent of concern discharge to the watershed.

The ILRP also requires agricultural dischargers to implement regular surface water assessment monitoring that includes a comprehensive suite of constituents (also referred to as "parameters") monitored periodically in a manner that allows for an evaluation of the condition of a water body and determination of whether irrigated agriculture operations are causing or contributing to any surface water quality problems. Monitoring data must be collected and analyzed in a manner that assures the quality of the data. The third-party must follow sampling and analytical procedures as specified in Attachment C, Order No. R5-2008-0005, Coalition Group Monitoring Program Quality Assurance Project Plan Guidelines (QAPP Guidelines) and any revisions thereto approved by the Central Valley Water Board's Executive Officer. Surface water monitoring data must be uploaded into the Central Valley Regional Data Center (CV RDC) database and will then be exported to the California Environmental Data Exchange Network (CEDEN) once data have been approved as CEDEN comparable. CEDEN is available to the public as well as the USEPA. ILRP Monitoring data through August 31, 2010 was included as lines of evidence for diuron in these impaired segments in the State's 2014 Integrated Report.

1.6 Commitment to Revise Pollution Controls, as necessary

"6. Commitment to Revise Pollution Controls, as Necessary

The demonstration should provide a statement that the State commits to revising the pollution controls, as necessary, if progress towards meeting water quality standards is not being shown. Also, the demonstration should identify how any changes to the pollution controls, and any other element of the original demonstration, will be reported to the public and EPA."

The Central Valley Water Board is committed to revising the pollution controls for diuron in the segments listed in Table E-1-1, as necessary, if progress towards meeting water quality standards is not being shown. Under the ILRP WDRS, review of the SQMP occurs at least once every five years to determine whether the approved management plan is resulting in water quality improvements. Central Valley Water Board staff will meet with the third-party and other interested parties to evaluate the sufficiency of management plans. From this the Executive Officer will determine whether and how the management plan should be updated based on new information and progress in achieving compliance. The Executive Officer may also require revisions if there is information indicating that degradation of surface water calls for the inclusion of additional areas, COC or improved management practices in the SQMP. If inadequate progress is being made, the third-party may be required to develop and implement a field monitoring study plan to characterize the commodity-specific discharge of the COC and evaluate the pollutant reduction efficacy of management practices leading to possible revision of the SQMP to include additional practices. Alternatively independent, on-site verification of implementation of management practices and evaluation of their adequacy may be required. Finally the board may revoke the third-party coverage for individual irrigated agricultural operations and require submittal of a report of waste discharge. The ILRP WDRs mandate the compliance of water quality triggers must be met as soon as possible, but not to exceed ten years from the date the SQMP is submitted for approval by the Executive Officer.

The review and any Executive Officer decision regarding adequate or inadequate progress are publicly available documents which are posted on the Boards website, currently at the following link:

https://www.waterboards.ca.gov/centralvalley/water_issues/irrigated_lands/water_quality/coalitions/

2 Category 4b Designated Water Body Pollutant Combinations

There are 14 water body pollutant combinations for diuron in the Central Valley Region that the State has included Category 4b designation in the 2014/16 Integrated Report. All 14 water bodies are impaired, but all also have active or completed management plans for diuron regulated under the Central Valley Water Board's ILRP. Agricultural discharges to these 14 water bodies are under WDR General Orders either for location specific third-party coalitions or for individual growers not participating in a coalition. Coalitions that contain diuron-impaired water bodies are the Sacramento Valley Water Quality Coalition, the San Joaquin County and Delta Area Water Quality Coalition, the East San Joaquin Water Quality Coalition, the Westside San Joaquin Water Quality Coalition and the Southern San Joaquin Water Quality Coalition, which has since split into several coalitions one of which, the Buena Vista Coalition, has a diuron-impaired water body. The WDRs for each coalition require similar actions when an exceedance in a water quality objective occurs. Management plans are proposed by and implemented by the Coalitions which can account for the varied success of the management plans as discussed in the below subsections. The subsections are broken down by Coalition (from North to South) and then split further by impaired water body. They discuss the individual coalitions, a general description of each waterbody including more current (post-August 30, 2010) water quality trends when available, and the associated LOEs and management plans of the impaired water bodies.

2.1 Sacramento Valley Water Quality Coalition

The Sacramento Valley Water Quality Coalition was founded in 2003 as a partnership between the Northern California Water Association and over 200 agricultural representatives following the creation of the Central Valley Water Board ILRP. It is comprised of over 8,600 growers and wetland managers covering more than 1.1 million acres of irrigated lands. The Coalition provides program management for thirteen sub-watershed groups responsible for monitoring, outreach and education, and general compliance of water quality regulations. A WDR General Order (Order No. R5-2014-0030-R1, amended by Order Nos. R5-2015-0115, R5-2016-0014, and R5-2016-0015) was adopted for the Coalition in March 2014 and later amended in 2015 and 2016. Under the current and past Central Valley Water Board Orders the Coalition is required to complete an Annual Monitoring Report. If more than one exceedance of a trigger limit occurs at a particular site within any three year period a Management Plan is required. The Sacramento Valley Water Quality Coalition has had two waterbodies with exceedances of diuron that required management plans. Management plans for Ulatis Creek and Willow Slough Bypass were implemented in 2009 and 2010 respectively. Thus far successful completion of the Ulatis Creek diuron management plan has been approved by the Central Valley Water Board's Executive Officer, and completion of the Willow Slough diuron management plan is expected by 2020. A more detailed description of both impairments and associated management plans follows below.

2.1.1 Ulatis Creek

Ulatis Creek (Solano County) is located in the Sacramento River Basin. The length of the impaired segment is approximately 17 miles. Figure E-2-1 shows diuron data for Ulatis creek. The 2014 line of

evidence (LOE) states that three out of eight samples collected before 2009 exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1), so that would normally require a 303(d) listing to category 5 (TMDL required). However, as shown in Figure E-2-1, in 2009 the Sacramento Valley Water Quality Coalition began implementing a Management Plan for Ulatis Creek and diuron. As shown in Figure E-2-1 30 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those one out of 30 exceed the UC Davis criterion. The implementation of an effective and successful management plan resulted in attainment of water quality standards for diuron in Ulatis Creek; for these reasons, it is recommended that the Ulatis Creek diuron was included under Category 4b in the State's 2014/2016 Integrated Report. It is expected that this segment can be fully de-listed for diuron in subsequent Integrated Reporting cycles.

The Sacramento Valley Water Quality Coalition's Management plan for Ulatis Creek diuron includes education and outreach components, implementation of management practices, and water quality monitoring. The education and outreach components included establishing current management practices by conducting surveys and encouraging growers to implement additional management practices. A management practice survey was completed between 2009 and 2010, and management practices were documented for 100% of coalition members representing 50% of total properties draining to Ulatis Creek. Management practices that were implemented by coalition members included not applying diuron when the soil was at field capacity, applying diuron to level vegetated ground and directing post-application runoff through vegetated drain ditches or vegetative filter strips and buffers. Additionally, many original users of diuron chose to use an alternative pesticide. After three years of compliance (2012-2015, see Figure E-2-1) and under the condition of continued monitoring, the Central Valley Water Board approved completion of the management plan in 2016 recognizing that Ulatis creek diuron concentrations are no longer exceeding the water quality objectives. Because there is an effective and comprehensive management plan, established under State ILRP pollution control requirements that will continue to result in diuron concentrations which are not exceeding water quality standards, it was recommended in the California 2014/2016 Integrated Report that the Ulatis Creek diuron listing be designated to Category 4b.

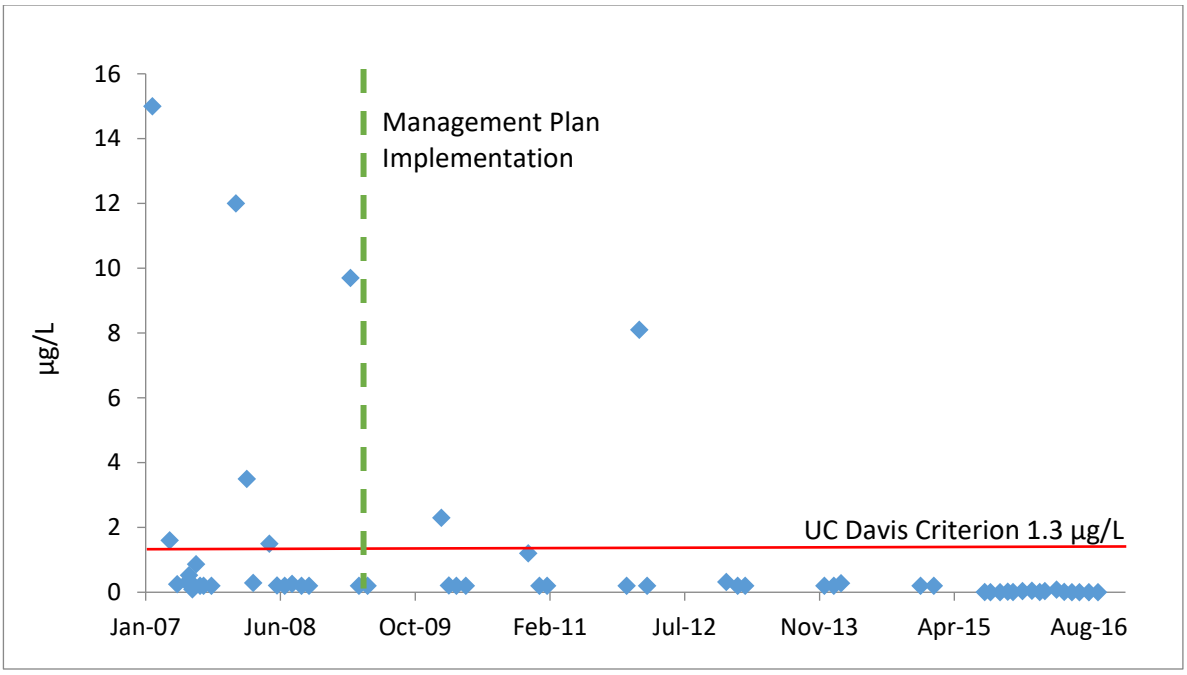

Figure E - 2-1 Diuron Water Quality Data for Ulatis Creek (2007-2016)

2.1.2 Willow Slough Bypass

Willow Slough Bypass (Solano County) is located in the Sacramento River Basin. The length of the impaired segment is approximately 6.2 miles. The 2014 LOE states that six out of 18 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 17 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those zero out of 17 exceeded the UCD criterion.

In 2010 the Sacramento Valley Water Quality Coalition began implementing a Management Plan for Willow Slough Bypass and diuron. The plan includes education and outreach components, implementation of management practices, and water quality monitoring. The education and outreach components included establishing current management practices by conducting surveys and encouraging growers to implement additional management practices. A management practice survey was completed between 2009 and 2010 and management practices were documented for 100% of coalition members representing 44% of total properties draining to Willow Slough Bypass. Management practices that were implemented by coalition members included not applying diuron when the soil was at field capacity, applying diuron to level vegetated ground, incorporating bare ground applications within 48 hours of application, directing post-application runoff through filtering vegetation, directing runoff and tailwater to settling ponds or sediment basins, directing irrigation tailwater to a tailwater return system and using cover crops, vegetated filter strip and or vegetated drainage ditches.

Additionally, many original users of diuron chose to use an alternative pesticide. After five years with no measured exceedances (2010-2015, see Figure E-2-2), the Sacramento Valley Water Quality Coalition asked for approval of completion in 2016. However, the Central Valley Water Board denied this request because there was only one monitoring event conducted during April which had two consecutive years of exceedances prior to management plan implementation. Two additional years of monitoring in April were requested before the management plan can be reconsidered for completion. Management plan completion is scheduled to be considered for approval by 2020. Because there is an effective and comprehensive management plan, established under State ILRP pollution control requirements that will continue to result in diuron concentrations which are not exceeding water quality standards, it is recommended in the California 2014/2016 Integrated Report that the Willow Slough Bypass diuron listing be designated to Category 4b.

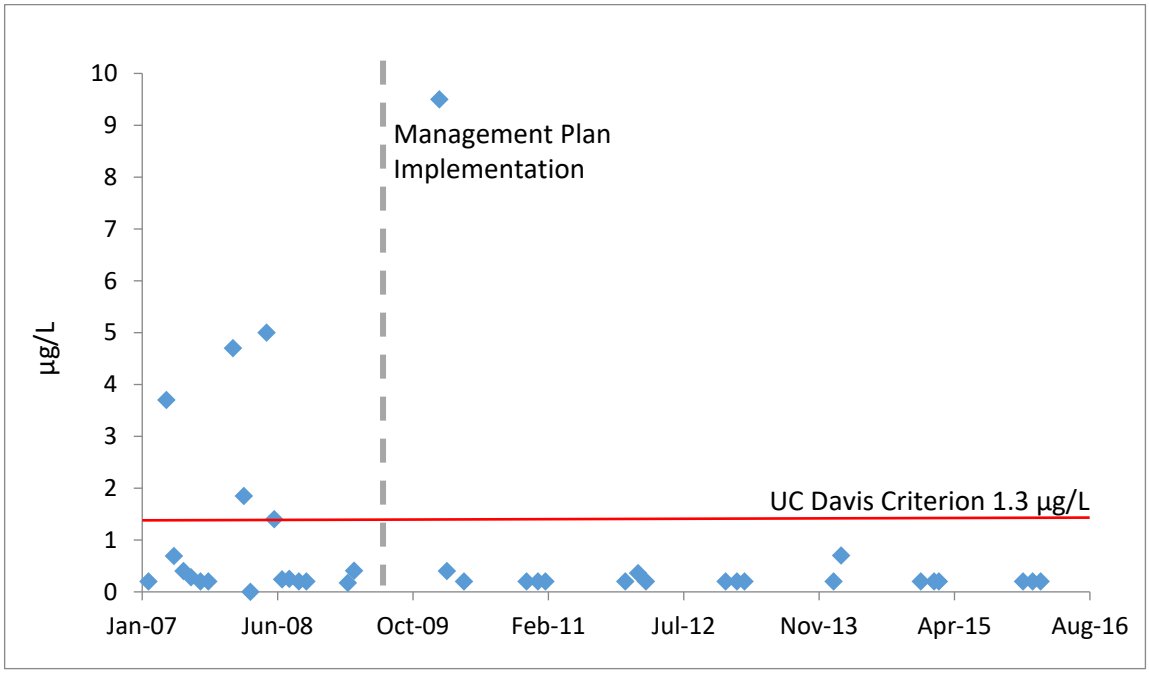

Figure E - 2-2 Diuron Water Quality Data for Willow Slough Bypass (2007-2016)

2.2 San Joaquin County and Delta Water Quality Coalition

The San Joaquin County and Delta Water Quality Coalition was founded in 2003 following the creation of the Central Valley Water Board's ILRP. It covers San Joaquin County, the Delta portions of Alameda and Contra Costa Counties, portions of Stanislaus County north of the Stanislaus River, and a small portion of Amador County that drains into the Mokelumne River The Coalition is operated and governed by the San Joaquin County Resource Conservation District. The goal of the Coalition is to implement programs that help farmers and ranchers reduce their impacts to the Waters of the State of California. These programs include best management practices, workshops, grower meetings, pesticide application information workshops, and monitoring of water quality as required by the Central Valley Water Board. A WDR General Order (Order No. R5-2014-0029-R1, amended by Order No. R5-2016-0015) was adopted

for the Coalition in March 2014 and later amended in 2016. Under these Board Orders if more than one exceedance of a trigger limit occurs at a particular site within any three year period a management plan is required. Since implementation of this order, the San Joaquin County and Delta Water Quality Coalition has had one waterbody with exceedances of diuron trigger limits that required a management plan. A management plan for Lone Tree Creek was implemented in 2008. Successful completion of the Lone Tree Creek diuron management plan was approved by the Central Valley Water Board in 2012. A more detailed description of the impairment and associated management plan follows below.

2.2.1 Lone Tree Creek

Lone Tree Creek (San Joaquin County) is located in the San Joaquin River Basin. The length of the impaired segment is approximately 15 miles. The 2010 LOEs state that 4 out of 13 samples exceeded the narrative objective using the criterion of 1.3 ug/L (Ma et al., 2001) as an evaluation guideline. During a review of the data, it was determined that 3 out of 11 samples exceeded the objective; therefore, the listing is confirmed. This discrepancy was the result of averaging errors. The samples collected on 1/14/2006 – 1/15/2006 and on 2/28/2006-3/1/2006 were considered as separate samples but they should have been averaged. The 2014 LOEs state that 3 out of 24 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). To evaluate more current water quality conditions in Lone Tree Creek, a review of data collected since the original listing was conducted. Four samples were collected from 2010-2012, resulting in 0 exceedances.

In 2008, Lone Tree Creek was established as a high priority management plan site by the San Joaquin County and Delta Water Quality Coalition. Focused outreach meetings with individual growers began and surveys were conducted. A 2011 survey indicated that growers had implemented management practices to reduce tail water runoff and pesticide use. The Coalition documented almost a 70% decrease in the rate of diuron use from 2004 to 2010 in the watershed. Monitoring showed an improvement in water quality. The most recent diuron exceedance was observed in 2008 (Figure E-2-3) and there have been no exceedances in the most recent 3 year period of data (2010-2012). In 2012, the Regional Water Board granted the San Joaquin County and Delta Coalition permission to cease Management Plan monitoring for diuron in Lone Tree Creek. The implementation of an effective and successful Management Plan resulted in attainment of water quality standards for diuron in Lone Tree Creek; for these reasons, it is recommended that the Lone Tree Creek diuron listing is considered for Category 4b designation. Because there is an effective and comprehensive management plan established under State ILRP pollution control requirements, that will continue to result in diuron concentrations which are not exceeding water quality standards, it was recommended in the California 2014/2016 Integrated Report that the Lone Tree Creek diuron listing be designated to Category 4b.

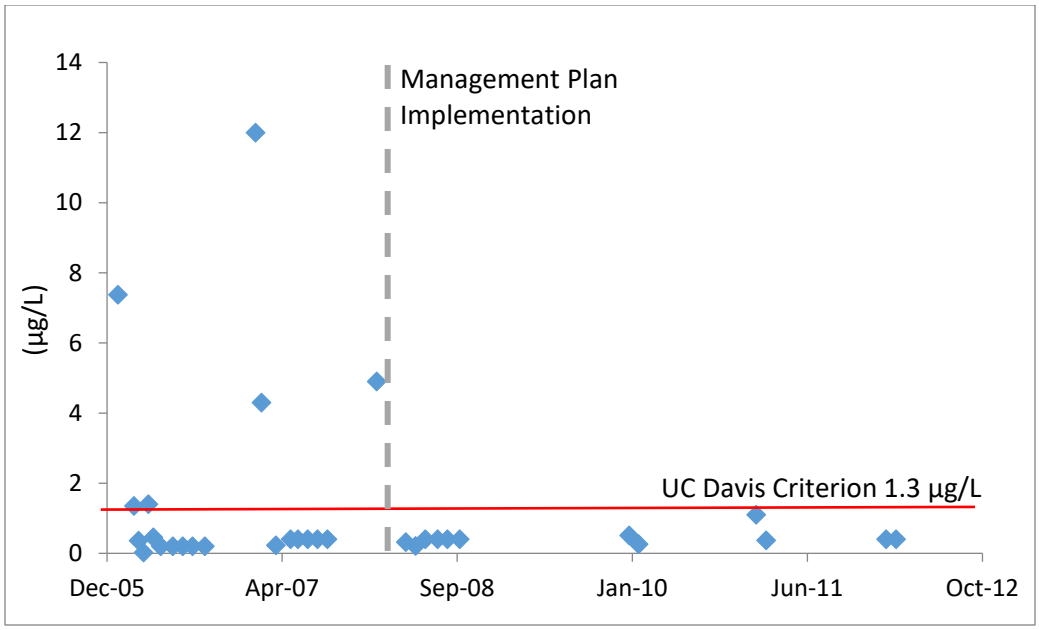

Figure E - 2-3 Diuron Water Quality Data for Lone Tree Creek (2007-2012)

2.3 East San Joaquin Water Quality Coalition

The East San Joaquin Water Quality Coalition was founded in 2003 as a cooperation of ten local farm groups and county agencies following the creation of the Central Valley Water Board ILRP. In 2005 the Coalition was granted non-profit status as a 501 c5 organization. The Coalition encompasses irrigated lands in the lower Stanislaus, Tuolumne and Merced River watersheds. The goals of the coalition are to develop and implement an economical and scientifically valid water monitoring program for area rivers, agricultural drains and groundwater basins, file required reports to maintain water quality standard compliance, spread costs equitably among farm owners and operators who are coalition members and communicate with landowners about how to solve water quality problems when they exist. A WDR General Order (Order No. R5-2012-0116-R3, amended by Order Nos. R5-2015-0115 and R5-2016-0015) was adopted for the Coalition in December 2012 and later amended in 2015 and 2016. Under past and current Central Valley Water Board Orders, if an exceedance of any trigger limit occurs at a particular site more than once within any three year period, a Management Plan is required. Since implementation of this order, the East San Joaquin Water Quality Coalition has had three waterbodies with exceedances of diuron that required management plans. Management plans for Cottonwood Creek, Dry Creek (Madera County) and Dry Creek (Stanislaus County) were implemented in 2009, 2009 and 2008 respectively. Thus far successful completion of the Dry Creek (Stanislaus County), Dry Creek (Madera County) and Cottonwood Creek diuron management plans have been approved by the Central Valley Water Board's Executive Officer. More detailed descriptions of the impairments and associated management plans follow below.

2.3.1 Cottonwood Creek

Cottonwood Creek (S Madera County) is located in the San Joaquin River Basin. The length of the impaired segment is approximately 29 miles. The 2014 LOE states that two out of 13 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 10 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those zero out of ten exceed the UCD criterion. However, this still exceeds the State Water Board's Listing Policy requirements for delisting a water body-pollutant combination (SWRCB, 2004 Table 4.1).

In 2009 the Eastern San Joaquin Water Quality Coalition began implementing a Management Plan for Cottonwood Creek and diuron due to the two exceedances that occurred in 2008. The plan includes education and outreach components, implementation of management practices, and water quality monitoring. The education and outreach components included establishing current management practices by conducting surveys and encouraging growers to implement additional management practices. A management practice survey was completed in 2010 with targeted members representing 45% of the total direct drainage area of Cottonwood Creek. Recommended management practices included controlling the timing of pumping or draining storm water into the waterway, spraying areas close to the waterway when the wind is blowing away from them, using electronic controlled sprayer nozzles, installing filter strips at least 10 feet wide around the field perimeter and reducing the amount of water used in surface irrigation. Since implementation of the management plan there has not been an exceedance of the evaluation guideline (Figure E-2-4). Under the condition of continued monitoring, the Central Valley Water Board approved completion of the management plan in 2012 recognizing that this impairment is in compliance of the water quality objectives. The implementation of an effective and successful management plan resulted in attainment of water quality standards for diuron in Cottonwood Creek. Because there is an effective and comprehensive management plan, established under State ILRP pollution control requirements, that will continue to result in diuron concentrations which are not exceeding water quality standards, it was recommended in the California 2014/2016 Integrated Report that the Cottonwood Creek diuron listing be designated to Category 4b.

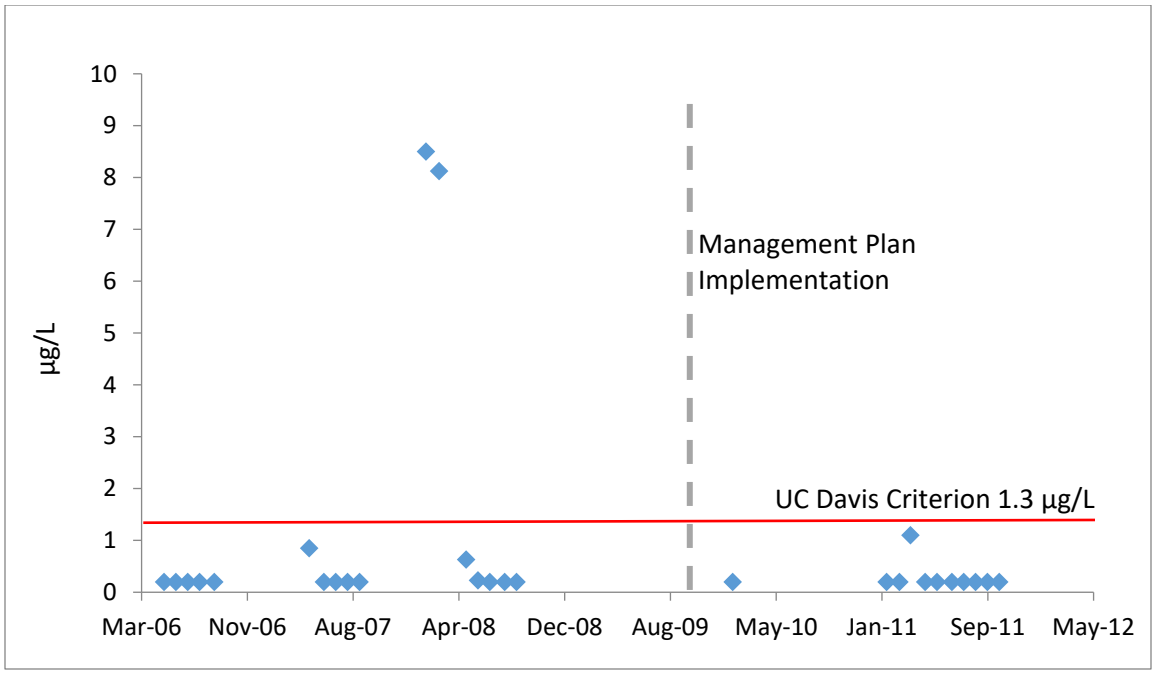

Figure E - 2-4Diuron Water Quality Data for Cottonwood Creek (2007-2011)

2.3.2 Dry Creek (Madera County)

Dry Creek (Madera County) is located in the San Joaquin River Basin. The length of the impaired segment is approximately 24 miles. The 2014 LOE states that two out of 13 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 17 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those one out of 17 exceed the UCD criterion.

In 2009 the Eastern San Joaquin Water Quality Coalition began implementing a Management Plan for Dry Creek (at Rd 18 in Madera County) and diuron. The plan includes education and outreach components, implementation of management practices, and water quality monitoring. The education and outreach components included establishing current management practices by conducting surveys and encouraging growers to implement additional management practices. A management practice survey was completed between 2011 and 2012 and management practices were documented for 53% of the acreage identified as direct drainage. Recommended management practices included installing and or improving berms between fields and the waterway, installing devices to control timing of pumping and or draining into the water way and spraying areas close to the waterbody when the wind is blowing away from them. Since implementation of the management plan there has only been one exceedance of the evaluation guideline (Figure E-2-5), which was addressed in the Eastern San Joaquin Water Quality Coalition's 2014 Annual Report. The Coalition asked for approval of completion in 2012. However, the Central Valley Water Board denied this request because of the exceedance that occurred in January 2013. Two consecutive years of compliance of water quality standards are required to be considered for

management plan completion. Following continued monitoring showing at least two years of compliance, the Central Valley Water Board approved completion of the management plan in 2017 recognizing that this impairment is in compliance of the water quality objectives. The implementation of an effective and successful management plan resulted in attainment of water quality standards for diuron in Dry Creek (Madera County). Because there is an effective and comprehensive management plan, established under State ILRP pollution control requirements, that will continue to result in diuron concentrations which are not exceeding water quality standards, it was recommended in the California 2014/2016 Integrated Report that the Dry Creek (Madera County) diuron listing be designated to Category 4b.

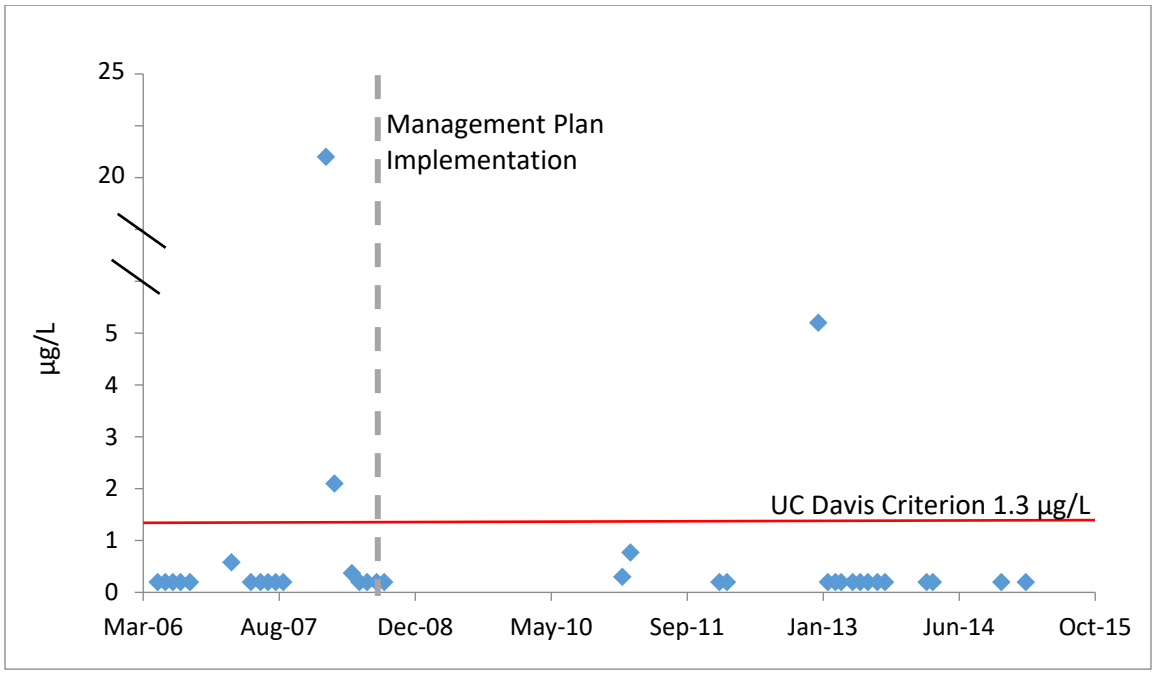

Figure E - 2-5Diuron Water Quality Data for Dry Creek (2006-2015)

2.3.3 Dry Creek (Stanislaus County)

Dry Creek (tributary to Tuolumne River at Modesto, E Stanislaus County) is located in the San Joaquin River Basin. The length of the impaired segment is approximately 34 miles. The 2014 LOE states that two out of 17 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 27 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those zero out of 27 exceed the UCD criterion. With the new samples this waterbody no longer exceeds the State Water Board's Listing Policy requirements for delisting a water body-pollutant combination (SWRCB, 2004 Table 4.1) and will be delisted in the upcoming 2018 Integrated Report Cycle.

In 2008 the Eastern San Joaquin Water Quality Coalition began implementing a Management Plan for Dry Creek (at Wellsford Rd in Stanislaus County) and diuron. The plan included education and outreach components, implementation of management practices, and water quality monitoring. The education and outreach components included establishing current management practices by conducting surveys and encouraging growers to implement additional management practices. A management practice survey was completed between 2009 and 2010 targeting members with the potential for direct drainage to Dry Creek. Recommended management practices included shutting off outside nozzles when spraying outer rows next to sensitive sites, constructing drainage basins or sediment ponds, maintaining filter strips at least 10 feet wide around field perimeters, allowing grass to grow in the centers of orchard rows, using recirculation or tailwater return systems, and using less water during surface irrigation for operations with no irrigation drainage. Since implementation of the management plan there has not been an exceedance of the evaluation guideline (Figure E-2-6). Under the condition of continued monitoring, the Central Valley Water Board approved completion of the management plan in 2012 recognizing that this impairment is in compliance of water quality standards. The implementation of an effective and successful management plan resulted in attainment of water quality standards for diuron in Dry Creek. Because there is an effective and comprehensive management plan, established under State ILRP pollution control requirements that will continue to result in diuron concentrations which are not exceeding water quality standards, it was recommended in the California 2014/2016 Integrated Report that the Dry Creek (Stanislaus County) diuron listing be designated to Category 4b.

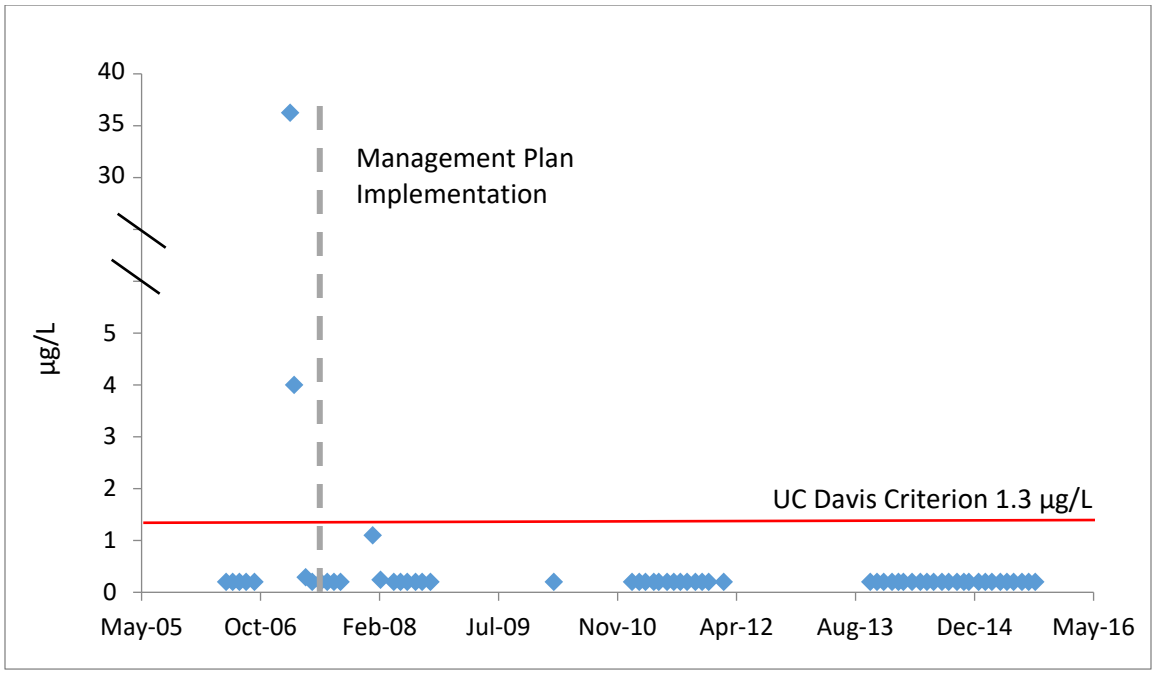

Figure E - 2-6 Diuron Water Quality Data for Dry Creek (2006-2015)

2.4 Westside San Joaquin Water Quality Coalition

The Westside San Joaquin River Water Quality Coalition was founded in 2003 following the creation of the Central Valley Water Board ILRP. The San Joaquin Valley Drainage Authority is the umbrella organization for the Westside Coalition acting as the third-party group to represent growers within the Coalition. The Coalition encompasses irrigated lands generally west of the San Joaquin River from approximately the Stanislaus River in the north to 10 miles south of Mendota. This area includes 459,000 acres of wetland and actively farmed lands representing approximately 2,800 landowners and 1,090 operators. A WDR General Order (Order No. R5-2014-0002-R2, amended by Order Nos. R5-2015-0115 and R5-2016-0015) was adopted for the Coalition in January 2014 and later amended in 2015 and 2016. Under past and current Central Valley Water Board Orders, if more than one exceedance of any trigger limit occurs at a particular site within any three year period, a Management Plan is required. Since implementation of this order, the Westside San Joaquin River Water Quality Coalition has had six waterbodies with exceedances of diuron that required management plans. Focused watershed plans were adopted for Del Puerto Creek (2011), Hospital Creek (2008), Ingram Creek (2008) and Orestimba Creek (2011) prior to adoption of the 2014 General Order. These plans discussed management practices that were being implemented, but actual water quality improvements were varied. These plans have recently been abandoned in favor of a new SQMP with a constituent-based approach. This SQMP has yet to be approved by the Executive officer, but approval is expected in 2018. Ramona Lake and the San Joaquin River at Lander Ave are included in this new SQMP. Compliance dates have not been altered in this SQMP and with the first occurring next year in 2017. More detailed descriptions of the impairments and associated management plans follow below.

2.4.1 Del Puerto Creek

Del Puerto Creek (Stanislaus County) is located in the San Joaquin River Basin. The length of the listed segment is approximately 6.5 miles. The 2010 LOEs state that two out of seven samples exceeded the narrative objective using the criterion of 1.3 ug/L (Ma et al., 2001) as an evaluation guideline. During a review of the data, it was determined that two out of six samples exceeded the objective. This discrepancy is the result of the application of the 4-day averaging period. The samples collected on 2/28/2006 and 3/1/2006 were considered separately but they should have been assessed as a 4-day average. Averaging the samples resulted in two exceedances out of six samples; therefore the listing is confirmed. The 2014 LOE states that four out of 31 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This still exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 50 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those 3 out of 50 exceed the UCD criterion (Figure E-2-7).

In 2011, the Westside San Joaquin River Water Quality Coalition began implementing a Focused Watershed Plan in the Del Puerto Creek watershed. The plan included education and outreach components, water quality monitoring, and implementation of management practices. The education and outreach components included compiling management practice inventory by conducting surveys,

addressing potential aerial overspray by identifying sensitive regions for aerial application, and seeking grant funding for management practice installation. Management practices included the use of PAM, reduction in pesticide use, use of alternative products, sprayer calibration, installation of high-efficiency irrigation systems, and installation of vegetated buffer zones along the creek's perimeter. According to the June 2014 Annual Report, the irrigated acreage with high-efficiency irrigation systems in the Del Puerto Creek watershed increased from 50% (2011 baseline) to 72%. According to a 2011 survey, PAM is used on 37% of the irrigated acreage in the watershed. The water quality monitoring plan was designed to track known water quality issues and to identify new issues. Since the implementation of the Focused Watershed Plan, there has been improvement in water quality. The Focused Watershed Plan was abandoned for a new constituent based SQMP in August 2016 in order to comply with the 2014 General Order. Approval of that new management plan for the Westside Coalition is expected in 2018. Because Irrigated Lands Regulatory Program requires the development of an effective and comprehensive management plan, and such a plan is expected to be finalized in 2018, requiring controls on diuron to below trigger limits, it is recommended in the California 2014/2016 Integrated Report that the Del Puerto Creek diuron listing be designated to Category 4b.

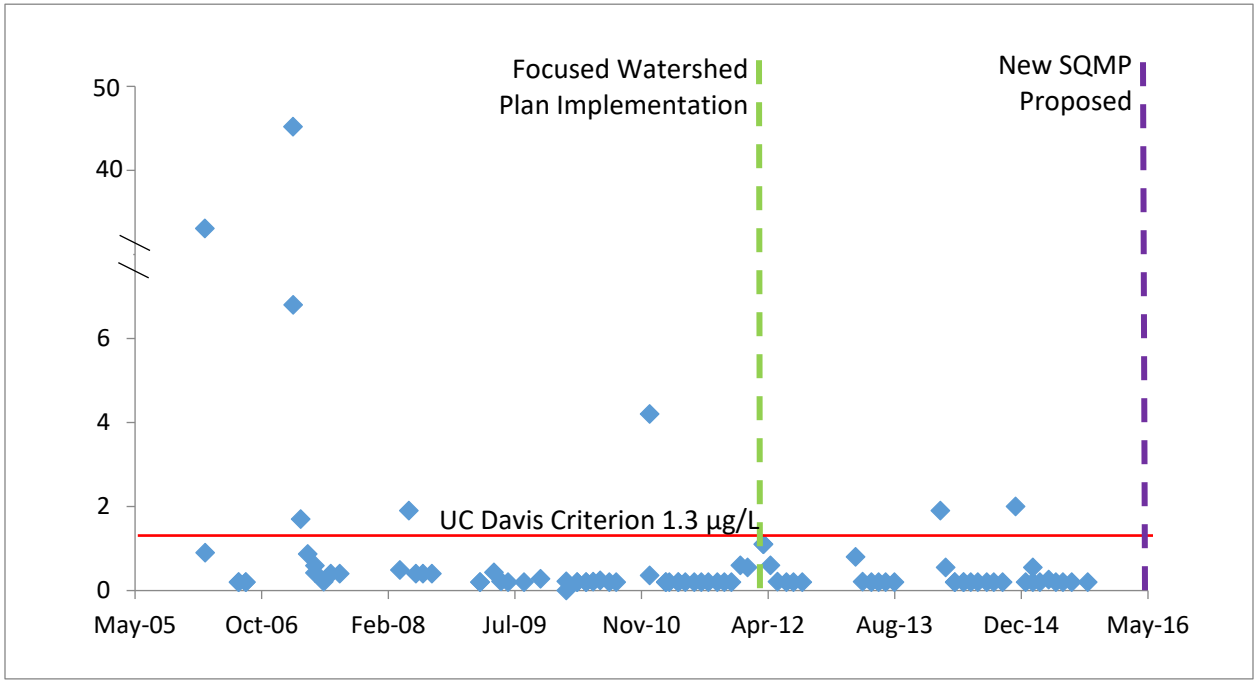

Figure E - 2-7 Diuron water quality data for Del Puerto Creek (2006 – 2015)

2.4.2 Hospital Creek

Hospital Creek (San Joaquin and Stanislaus Counties) is located in the San Joaquin River Basin. The length of the impaired segment is approximately 20 miles. The 2014 LOE states that four out of 20 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 28 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those three out of 28 exceed the UCD criterion. However, there have not been any exceedances of the UC Davis Criteria used as the evaluation guideline in Hospital Creek since 2012.

In 2008, the Westside San Joaquin Water Quality Coalition began implementing a Focused Watershed Management Plan for Hospital Creek and diuron. The plan included source identification, education and outreach components, implementation of management practices, and water quality monitoring. The education and outreach components included establishing current management practices by conducting surveys and encouraging growers to implement additional management practices. A management practice survey was completed from 2009-2010 to establish baseline management practices. Recommended management practices presented to growers in outreach meetings included irrigation drainage return systems, sediment ponds for containing irrigation drainage, managed vegetation in drainage ditches and use of PAM in irrigation water. Since implementation of the management plan there have been several exceedances of the evaluation guideline (Figure E-2-8). However, the WDRs for the Westside San Joaquin Water Quality Coalition allow ten years for compliance. The Focused Watershed Plan was updated to a new constituent based SQMP in August 2016 in order to comply with the 2014 General Order. Approval of that new management plan for the Westside Coalition is expected in 2018. Because Irrigated Lands Regulatory Program requires the development of an effective and comprehensive management plan expected to be finalized in 2018, requiring controls on diuron to below trigger limits, and because the controls being implemented are already resulting in diuron concentrations in attainment of standards since 2012, it is recommended in the California 2014/2016 Integrated Report that the Hospital Creek diuron listing be designated to Category 4b.

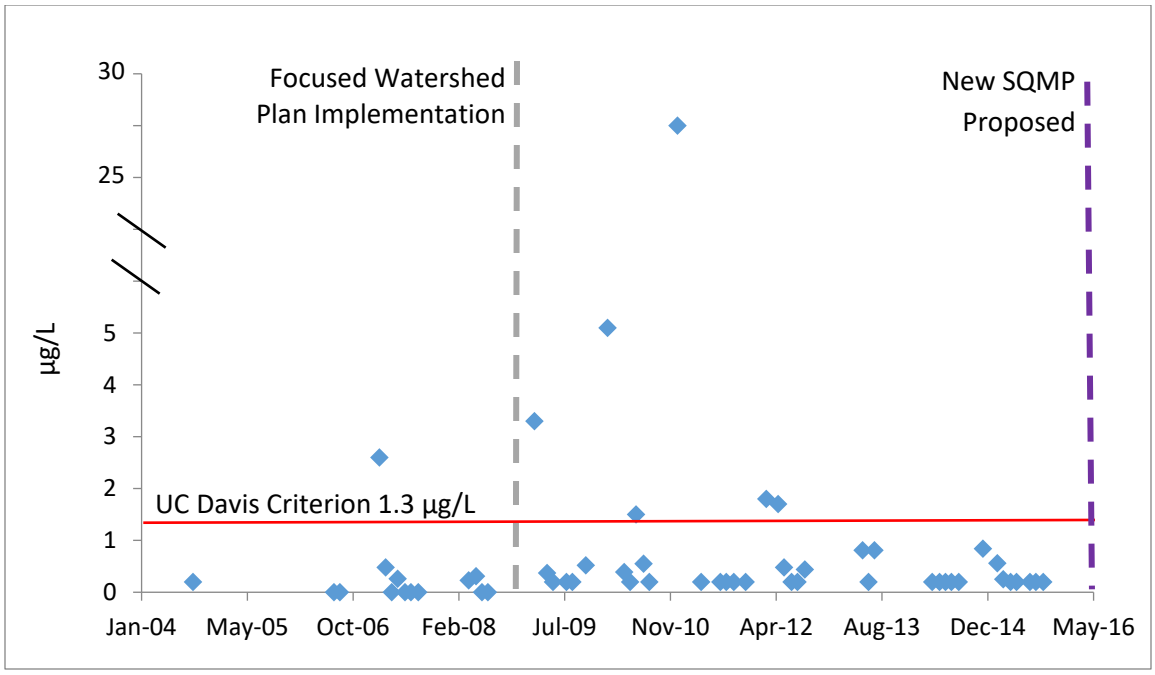

Figure E - 2-8 Diuron Water Quality Data for Hospital Creek (2004-2015)

2.4.3 Ingram Creek

Ingram Creek (from confluence with Hospital Creek to Hwy 33 crossing) is located in the San Joaquin River Basin. The length of the impaired segment is approximately 2.8 miles. The 2014 LOE states that three out of 21 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 41 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those 5 out of 41 exceed the UCD criterion. However, there have not been any exceedances of the UC Davis Criteria used as the evaluation guideline since 2013.

However, in 2008 the Westside San Joaquin Water Quality Coalition began implementing a Focused Watershed Management Plan for Ingram Creek and diuron. The plan includes source identification, education and outreach components, implementation of management practices, and water quality monitoring. The education and outreach components included establishing current management practices by conducting surveys and encouraging growers to implement additional management practices. A management practice survey was completed in 2009-2010 to establish baseline management practices. These surveys were followed by grower outreach meetings to discuss water quality impairments and suggest alternative management practices. Recommended management practices presented to growers included irrigation drainage return systems, sediment ponds for containing irrigation drainage, managed vegetation in drainage ditches and use of PAM in irrigation water. Since implementation of the management plan there have been several exceedances of the evaluation guideline (Figure E-2-9). However, the WDRs for the Westside San Joaquin Water Quality Coalition allow ten years for compliance. The Focused Watershed Plan was abandoned for a new

constituent based SQMP in August 2016 in order to comply with the 2014 General Order. Approval of that new management plan for the Westside Coalition is expected in 2018. Because Irrigated Lands Regulatory Program requires the development of an effective and comprehensive management plan, and such a plan is expected to be finalized in 2018, requiring controls on diuron to below trigger limits, and because the practices being implemented are resulting in diuron concentrations in attainment of standards since 2013, it is recommended in the California 2014/2016 Integrated Report that the Ingram Creek diuron listing be designated to Category 4b.

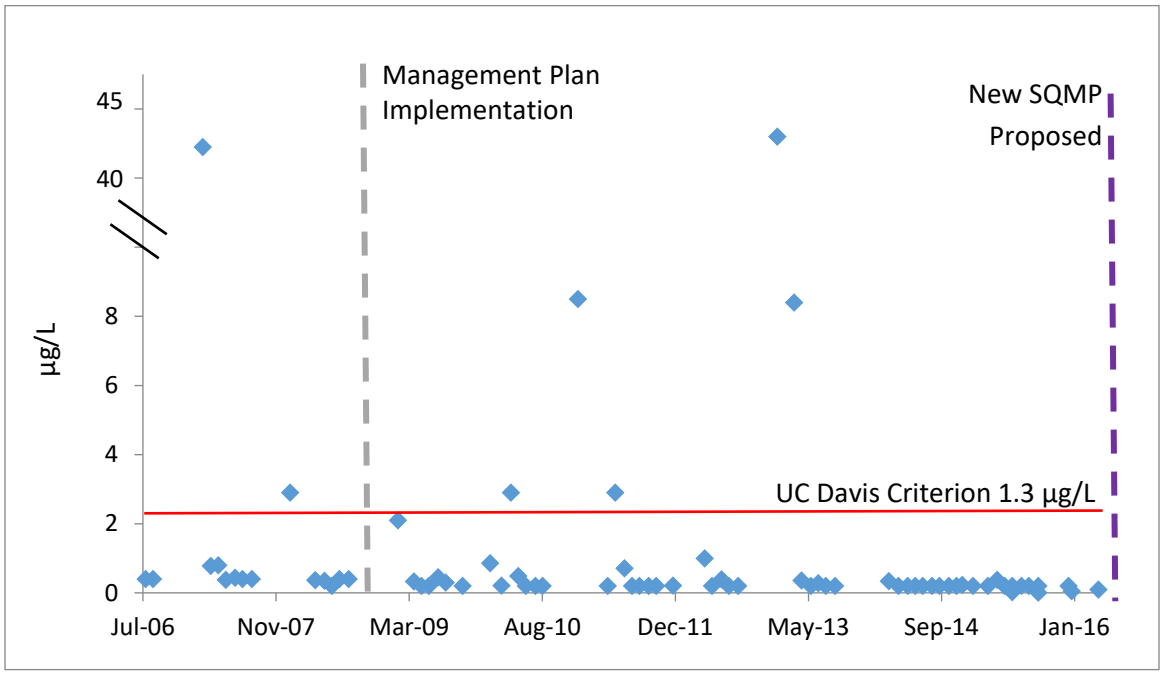

Figure E - 2-9 Diuron Water Quality Data for Ingram Creek (2006-2017)

2.4.4 Orestimba Creek

Orestimba Creek has two impaired segments, one above and one below Kilburn Road. Orestimba Creek (above Kilburn Road, Stanislaus County) is located in the San Joaquin River Basin. The length of the impaired segment is approximately 9 miles. The 2014 LOE states that 3 out of 23 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 30 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those zero out of 30 exceed the UCD criterion (Figure E-2-10). With the new samples this waterbody no longer exceeds the State Water Board's Listing Policy requirements for delisting a water body-pollutant combination (SWRCB, 2004 Table 4.1) and will be delisted in the upcoming 2018 Integrated Report Cycle.

Orestimba Creek (below Kilburn Road, Stanislaus County) is located in the San Joaquin River Basin. The length of the impaired segment is approximately 2.7 miles. The 2010 LOEs state that 12 out of 62 samples exceeded the narrative objective using the criterion of 1.3 ug/L (Ma et al., 2001) as an evaluation guideline. During a review of the data, it was determined that 4 out of 40 samples exceed the objective; therefore, the listing is confirmed. The discrepancy is the result of the application of the 4-day averaging period. There were several samples that were considered individually in the original LOEs that should have been averaged. The 2014 LOE states that 3 out of 40 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 16 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those one out of 16 exceed the UCD criterion (Figure E-2-11). With the new samples this waterbody no longer exceeds the State Water Board's Listing Policy requirements for delisting a water body-pollutant combination (SWRCB, 2004 Table 4.1) and will be proposed for delisting in the upcoming 2018 Integrated Report Cycle

A Focused Watershed Management Plan was implemented for both segments of Orestimba Creek in 2011. The plan included education and outreach components, implementation of management practices, and water quality monitoring. The education and outreach components included compiling management practice inventory by conducting surveys, addressing potential aerial overspray by identifying sensitive regions for aerial application, and seeking grant funding for management practice installation. A management practice survey was completed in 2011. Management practices included the use of PAM, reduction in pesticide use, use of alternative products, sprayer calibration, installation of high-efficiency irrigation systems, and installation of vegetated buffer zones along the creek's perimeter. According to the June 2014 Annual Report, the irrigated acreage with high-efficiency irrigation systems in the Orestimba Creek watershed increased from 50% (2011 baseline) to 59%. According to the 2011 survey, PAM is used on 29% of the irrigated acreage in the watershed. There has only been one exceedance in one segment since its implementation (Figure E-2-10 and Figure E-2-11). However, the Focused Watershed Plan was abandoned for a new constituent based SQMP in August 2016 in order to comply with the 2014 General Order. Approval of that new management plan for the

Westside Coalition is expected in 2018. Because Irrigated Lands Regulatory Program requires the development of an effective and comprehensive management plan, and such a plan is expected to be finalized in 2018, requiring controls on diuron to below trigger limits, and because new data indicates that diuron no longer exceeds water quality standards in both segments, it is recommended in the California 2014/2016 Integrated Report that both segments of Orestimba Creek's diuron listing be designated to Category 4b.

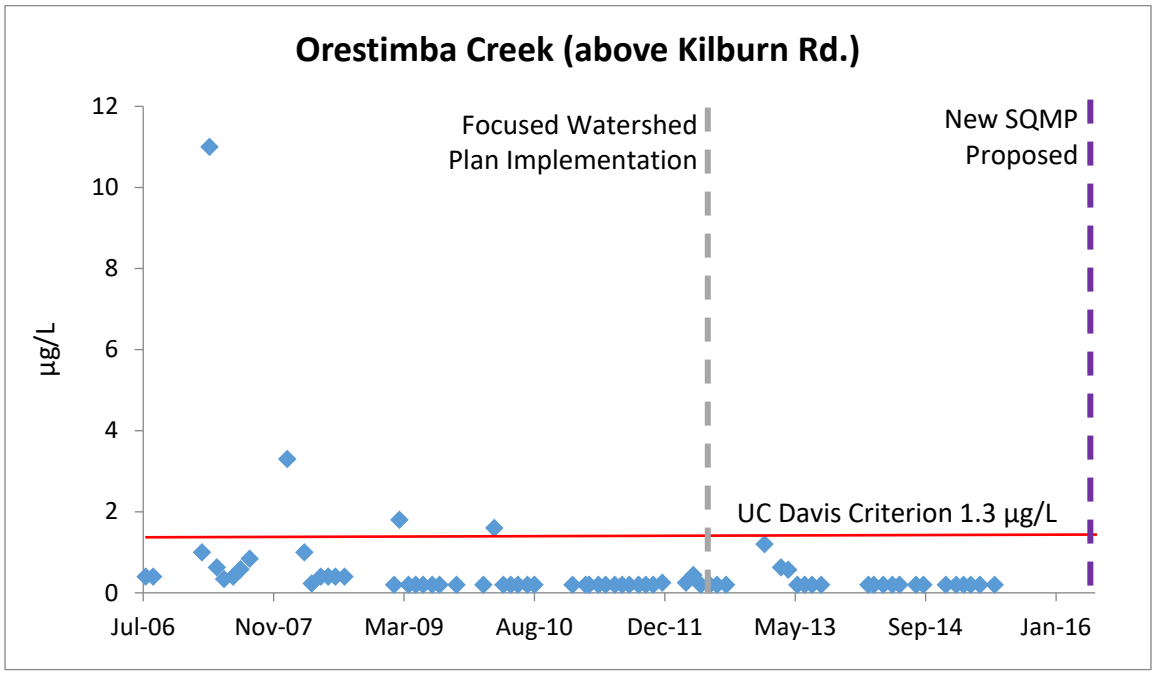

Figure E - 2-10 Diuron Water Quality Data for Orestimba Creek above Kilburn Rd. (2006-2015)

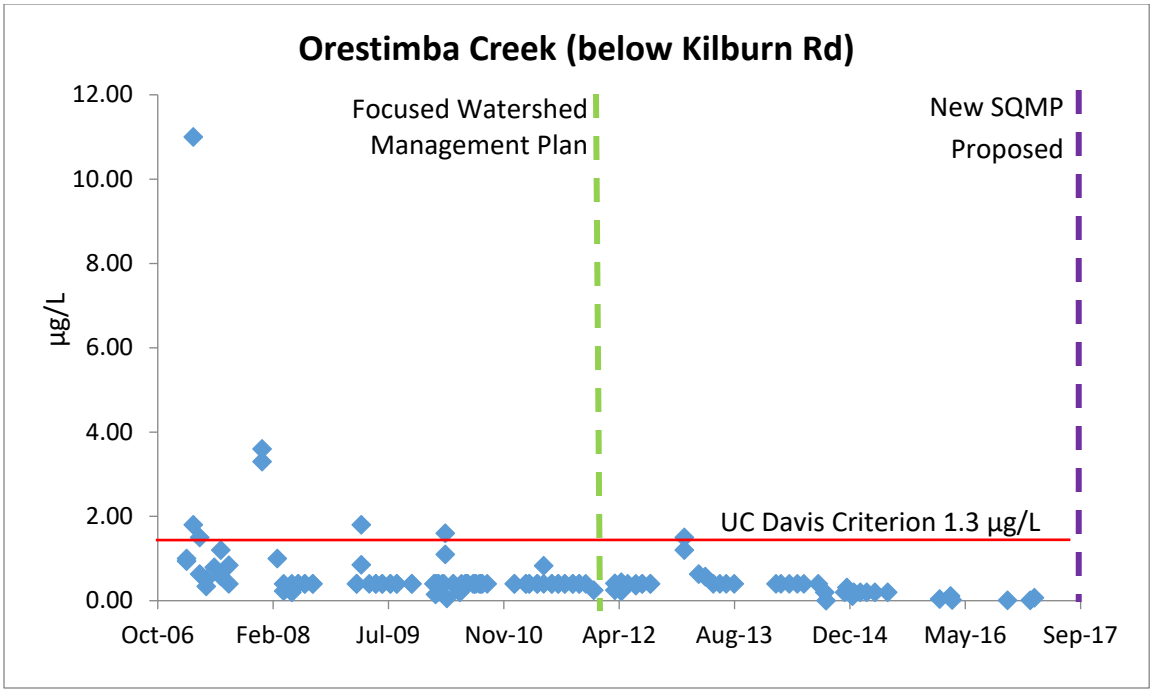

Figure E - 2-11 Diuron Water Quality Data for Orestimba Creek below Kilburn Rd. (2006-2017)

2.4.5 Ramona Lake

Ramona Lake is located in the San Joaquin River Basin. The impaired area assessed is approximately 28 acres. The 2014 LOE states that 4 out of 19 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline (Figure E-2-12). This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 38 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those zero out of 38 exceed the UCD criterion. With the new samples this waterbody no longer exceeds the State Water Board's Listing Policy requirements for delisting a water body-pollutant combination (SWRCB, 2004 Table 4.1) and will be delisted in the upcoming 2018 Integrated Report Cycle.

The Westside San Joaquin River Water Quality Coalition had planned on adopting a Focused Watershed Plan in 2015. However, after the 2014 General Order, the Coalition proposed a new constituent based SQMP in August 2016. Ramona Lake was included in this new plan with a compliance date of 2019. Approval of that new management plan for the Westside Coalition is expected in 2018. This Plan categorizes the water quality issues into logical groups based on the apparent cause and likely effective management activities that may be used to address the issues. The First Priority COC Group is Aquatic toxicity and pesticides with the SQMP strategy to address toxicity resulting from pesticide discharge focusing on tailwater reduction and pesticide application control. Education and outreach will be significant parts of the strategy as well as assisting with logistical support, financial support and other actions to encourage the adoption of proposed best management practices by growers. The Coalition

will continue to track changes in water quality to determine the effectiveness of changes in management practices. Because Irrigated Lands Regulatory Program requires the development of an effective and comprehensive management plan, and such a plan is expected to be finalized in 2018, requiring controls on diuron to below trigger limits, and because new data indicates that diuron concentrations in Ramona Lake no longer exceed water quality standards, it is recommended in the California 2014/2016 Integrated Report that the Ramona Lake diuron listing be designated to Category 4b.

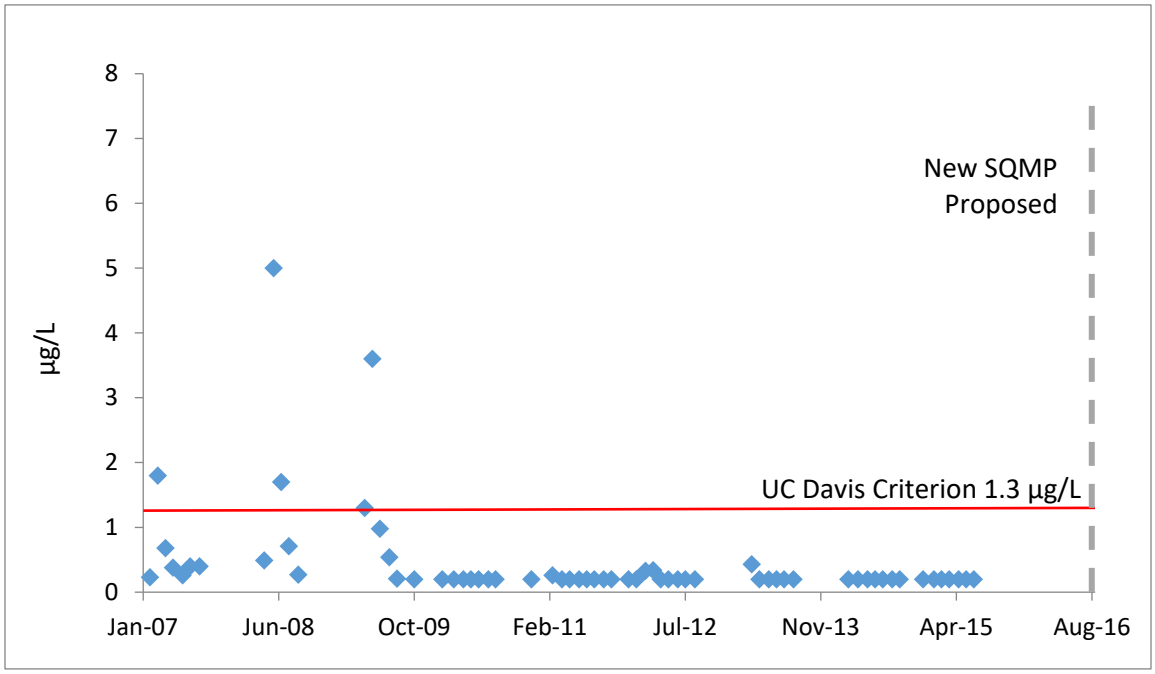

Figure E - 2-12 Diuron Water Quality Data for Ramona Lake (2006-2015)

2.4.6 San Joaquin River (Bear Creek to Mud Slough)

The San Joaquin River (from Bear Creek to Mud Slough) is located in the San Joaquin River Basin. The length of the impaired segment is approximately 14 miles. The 2014 LOE states that four out of 38 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline (Figure E-2-13). This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 61 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those three out of 61 exceed the UCD criterion. With the new samples this waterbody no longer exceeds the State Water Board's Listing Policy requirements for delisting a water body-pollutant combination (SWRCB, 2004 Table 4.1) and will be delisted in the upcoming 2018 Integrated Report Cycle.

The Westside San Joaquin River Water Quality Coalition had planned on adopting a Focused Watershed Plan. However, after the 2014 General Order, the Coalition proposed a new constituent based SQMP in August 2016. The San Joaquin River (from Bear Creek to Mud Slough) was included in this new plan with a compliance date of 2017. This Plan categorizes the water quality issues into logical groups based on the apparent cause and likely effective management activities that may be used to address the issues. The First Priority COC Group is Aquatic toxicity and pesticides with the SQMP strategy to address toxicity resulting from pesticide discharge focusing on tailwater reduction and pesticide application control. Education and outreach will be significant parts of the strategy as well as assisting with logistical support, financial support and other actions to encourage the adoption of proposed best management practices by growers. The Coalition will continue to track changes in water quality to determine the effectiveness of changes in management practices. Approval of that new management plan for the Westside Coalition is expected in 2018. Because Irrigated Lands Regulatory Program requires the development of an effective and comprehensive management plan, and such a plan is expected to be finalized in 2018, requiring controls on diuron to below trigger limits, and because new data indicates that diuron in this segment no longer exceed water quality standards, it is recommended in the California 2014/2016 Integrated Report that the San Joaquin River (Bear Creek to Mud Slough) diuron listing be designated to Category 4b.

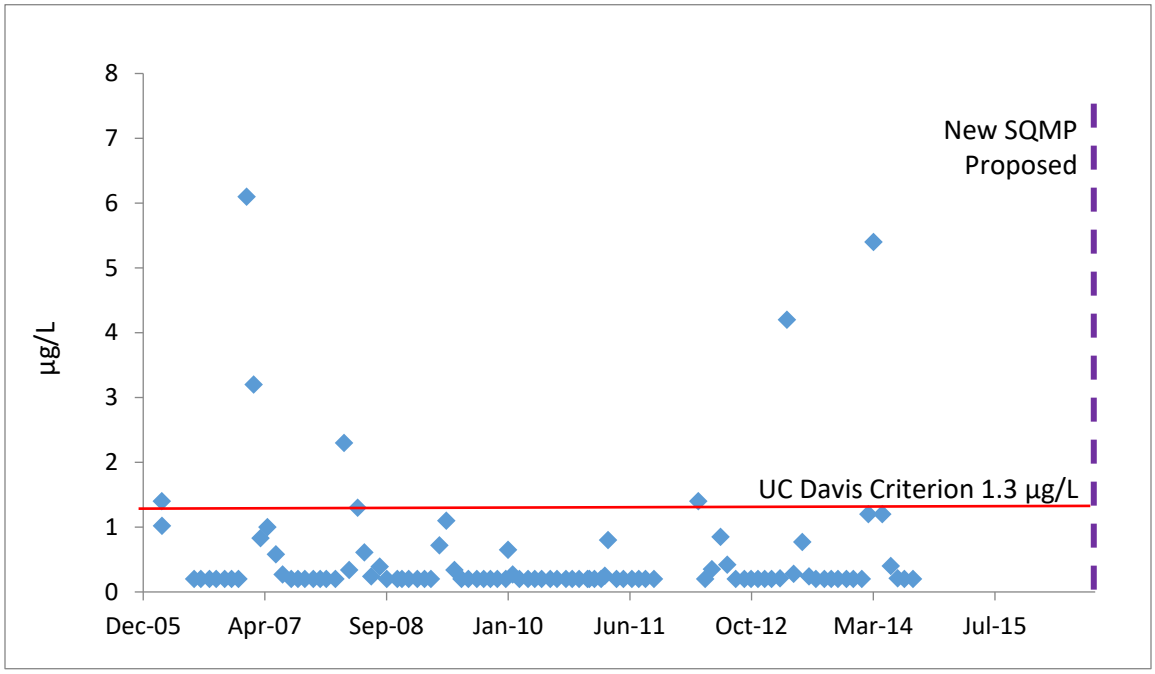

Figure E - 2-13 Diuron Water Quality Data for San Joaquin River (Bear Creek to Mud Slough) (2006-2014)

2.5 Southern San Joaquin Water Quality Coalition/Buena Vista Coalition

The Southern San Joaquin Water Quality Coalition was founded in 2003 following the creation of the Central Valley Water Board ILRP and represented growers within the entire Tulare Lake Basin. However, the Coalition amended its Memorandum of Understanding in 2012 to provide that Third Party representation under the General WDR for growers within the Tulare Lake Basin Area (Order No. R5-2013-0120). This General Order with expanded groundwater quality protection would be provided by groups being formed within the Kings, Kaweah, Tule and Kern watersheds. From this eight separate coalitions were formed from the Southern San Joaquin Water Quality Coalition. In 2013, the Buena Vista Coalition began serving as the third-party entity to represent owners and operators of irrigated lands located within the Buena Vista Water Storage District. The Coalition covers approximately 50,000 acres of irrigated agriculture including all parcels within the Buena Vista Water Storage District with the exception of the Henry Miller Water District.

Under past and current Central Valley Water Board Orders if an exceedance of trigger limits occurs more than once at a particular site within any three year period, a Management Plan is required. When the Buena Vista Coalition became the third-party representing growers, they took over these responsibilities for growers within their boundaries. Under the Southern San Joaquin Water Quality Coalition there was one diuron impairment in the Main Drain Canal (Kern County). A management plan for this impairment was implemented. When the notice of applicability was issued to the Buena Vista Coalition, they continued implementation of this management plan. A more detailed description of the impairment and associated management plan follows below.

2.5.1 Main Drain

The Main Drain Canal (Kern County) is located in the Tulare Lake Basin. The length of the impaired segment is approximately 20 miles. The 2014 LOE states that three out of 14 samples exceeded the narrative objective using the UC Davis chronic criteria of 1.3 ug/L (Fojut et al., 2012) as an evaluation guideline. This exceeds the State Water Board's Listing Policy requirements for listing a water body-pollutant combination (SWRCB, 2004 Table 3.1). There are 39 additional samples that were taken after the 2014 Integrated Report solicitation date (31 August, 2010) and of those two out of 39 exceed the UCD criterion. .

In 2008 the Southern San Joaquin Water Quality Coalition began implementing a Management Plan for the Main Drain Canal and diuron. In 2013, the implementation of this management plan became the responsibility of the Buena Vista Coalition which replaced the Southern San Joaquin Water Quality Coalition in this area. The original management plan included education and outreach components, implementation of management practices, and water quality monitoring. The education and outreach components included establishing current management practices by conducting surveys and encouraging growers to implement additional management practices. However during the transition from the Southern San Joaquin Water Quality Coalition to the Buena Vista Coalition, the management plan was updated to cover more general contaminants of concern. Diuron was not specifically included in this list. The goal of the 2012 management plan is to limit exceedances if possible and more

prominently eliminate flow of the Main Drain Canal to Waters of the State. Because the Main Drain Canal is used as a tailwater system, irrigation runoff frequently discharges into the canal. Since July 2013, water in the Main Drain Canal has been restricted to the Buena Vista Water District Boundary. An increase in the use of high efficiency irrigation systems has helped in reducing flow in the Canal with over 20% of the irrigated acres in the Buttonwillow Service Area (BSA). There were over 8,000 acres of BSA land fallowed in 2014. Approximately 3,900 acres of farm land in the BSA have been permanently taken out of production. 2,800 of these acres are covered with conservation easements. Growers have also added turnouts, increased pump capacity, and in general planned to use drain water more frequently. Since implementation of the management plan in 2012, there have been 3 exceedances of the evaluation guideline (Figure E-2-14), and no exceedances since 2012. Because there is an effective and comprehensive management plan, established under State ILRP pollution control requirements that will continue to result in diuron concentrations which are not exceeding water quality standards, it was recommended in the California 2014/2016 Integrated Report that the Main Drain (Kern County) diuron listing be designated to Category 4b.

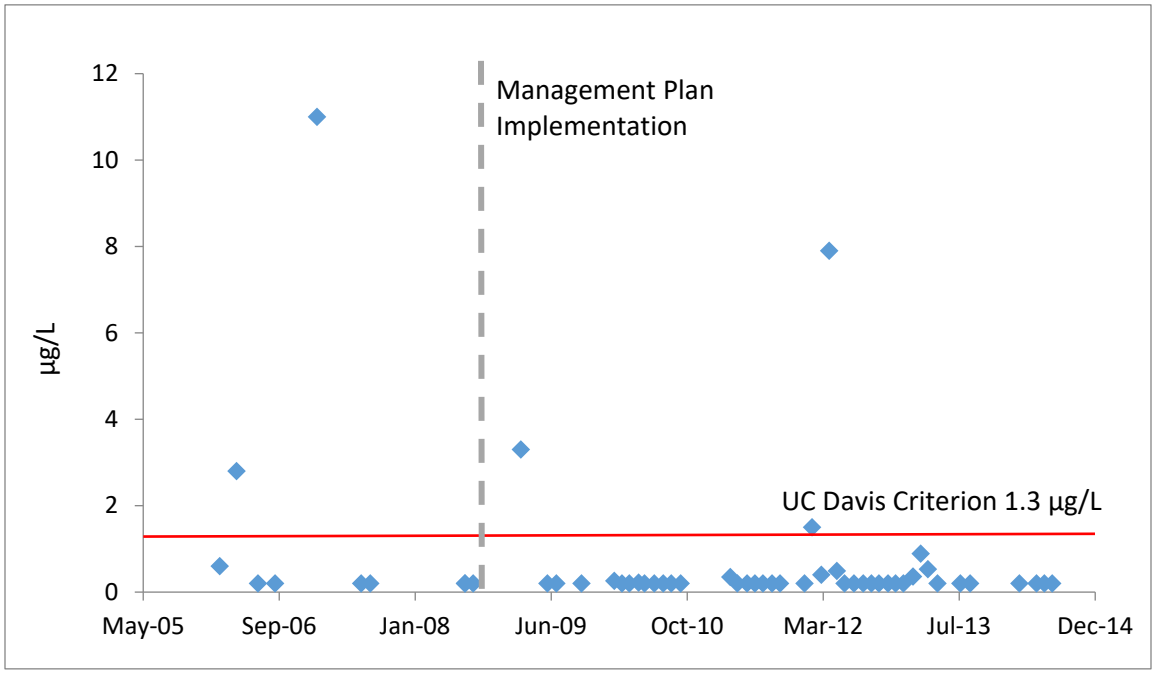

Figure E - 2-14 Diuron Water Quality Data for Main Drain (2006-2014)

2.6 Evaluation Summary

A summary of the decisions made for the diuron impaired water bodies proposed for Category 4b designation during the 2014 Listing Cycle and the expected timeline of these impaired water bodies follow in Table E-2-1. All of these water bodies have active or completed management plans, or management plans pending approval under ILRP WDRs for third-party Coalitions representing individual growers. It is expected that all these impairments will be resolved within the ten-year compliance time frame for the ILRP.

In summary, of the fourteen Category 4(b) designated water bodies, it is expected that nine will be proposed for delisting during the 2018 Integrated Report Cycle. These include Dry Creek (Stanislaus County), both segments of Orestimba Creek, Ramona Lake, and the San Joaquin River (From Bear Creek to Mud Slough, Lone Tree Creek, Cottonwood Creek, Dry Creek (Madera County) and Ulatis Creek, because they have completed management plans through the ILRP indicating they are achieving water quality standards. The remaining five water bodies need continued monitoring to show water quality improvements in order to achieve completion of their active management plans and be eligible for delisting. The 2014/16 Integrated Report proposes that all of these waterbodies be designated to Category 4b on the basis that there are pollution control requirements, the ILRP management plans, which are stringent enough to implement applicable water quality standards.

Table E - 2-1 Status of management plans of proposed Category 4b waterbodies and timeline for future decisions.

Water Body Segment	Management Plan Status		Timeline
	Active Management Plan	Completed Management Plan	
Cottonwood Creek (S Madera County)		X	Delist during 2018 Listing Cycle
Del Puerto Creek	X		More data needed to delist
Dry Creek (Madera County)		X	Delist during 2018 Listing Cycle
Dry Creek (tributary to Tuolumne River at Modesto, E Stanislaus County)		X	Delist during 2018 Listing Cycle
Hospital Creek (San Joaquin and Stanislaus Counties)	X		More data needed to delist
Ingram Creek (from confluence with Hospital Creek to Hwy 33 crossing)	X		More data needed to delist
Lone Tree Creek		X	Delist during 2018 Listing Cycle
Main Drain (Kern County)	X		More data needed to delist
Orestimba Creek (above Kilburn Road)	X		Delist during 2018 Listing Cycle
Orestimba Creek (below Kilburn Road)	X		Delist during 2018 Listing Cycle
Ramona Lake	X		Delist during 2018 Listing Cycle
San Joaquin River (Bear Creek to Mud Slough)	X		Delist during 2018 Listing Cycle
Ulatis Creek (Solano County)		X	Delist during 2018 Listing Cycle
Willow Slough Bypass (Yolo County)	X		More data needed to delist

3 References

SWRCB. 2017. 2014 and 2016 California Integrated Report - Clean Water Act Section 303(d) and 305(b). State Water Resources Control Board (SWRCB). Sacramento, California. Available: https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml